

## CHILDREN AND MOBILE PHONE USE: Is there a Health Risk?

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The paper, "Mobile Phone Use: it's time to take precautions", published in the April 2001 issue of the *Journal of the Australasian College of Nutritional & Environmental Medicine*, examines what is currently known about the possible hazards of mobile phone use.

At first, this subject may not seem relevant to children's lives until it is realised that, today, the fastest growing group of mobile phone users are children and young people. This growth is actively encouraged by professional advertising campaigns from the mobile phone industry, extolling how indispensable the phones are to their lifestyles.

Concerns about this were even voiced by the managing director of the Australian Telecommunications Users Group (ATUG), Allan Horsley, who expressed concerns about mobile phone companies deliberately targeting youth. "They have really gone out after the young people with prepay cards and coloured handsets," he said.

With this advertising blitz, produced by the same transnational public relations corporations that previously gave us such delightful cartoon characters as "Joe Camel" for the tobacco industry, no words of warning are heard. However, within the scientific community, there is a growing chorus of expert voices that are urging caution because, if there are adverse health effects from mobile phone use, it will be the children who will be in the front line and who may pay the highest price. For the sake of the future of our children's health, we need to heed these voices seriously and limit children's unnecessary use of mobile phones.

### The voices of reason

1) In 1999, as a result of public concerns about possible health hazards from mobile phone technology, the UK Government formed the Independent Expert Group on

Mobile Phones (IEGMP) to examine possible effects of mobile phones and transmitter base stations. This group was headed by Sir William Stewart, the famous British biochemist and President of the British Association for the Advancement of Science.

What made the Stewart Inquiry unique was that it was made up almost entirely of biomedical specialists who were able to focus many man-years of acquired specialist knowledge on the problem. Their report, "Mobile Phones and Health", was released in April 2000. In regard to the use of mobile phones by children, the IEGMP stated:

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of mobile phones.**

"If there are currently unrecognised adverse health effects from the use of mobile phones, children may be more vulnerable because of their developing nervous system, the greater absorption of energy in the tissues of the head and a longer lifetime of exposure. In line with our precautionary approach, we believe that the widespread use of mobile phones by children for non-essential calls should be discouraged. We also recommend that the mobile phone industry should refrain from promoting the use of mobile phones by children."

Sir William said at a science conference at Glasgow University in September 2001 that mobile phone makers often present their products in adverts as essential "back to school" items for children. Such adverts are irresponsible, said Sir William. He added:

"They are irresponsible because children's skulls are not fully developed. They will be using mobile phones for longer, and their effects won't be known for some time to come. Mobile phone technology has been led by the physical sciences. My own view is we ought to be doing more work on the potential biological effects."

Sir William also said he would not allow his grandchildren to use mobile phones.

2) On December 8, 2000, the German Academy of Pediatrics issued a statement advising parents to restrict their children's use of mobile phones. They advised that all mobile phone users should keep conversations as brief as possible, but that additional precautions are appropriate for children in view of "special health risks" associated with their growing bodies.

3) On July 31, 2001, Wolfram Koenig, the new head of the Bundesamt für Strahlenschutz, which is the federal authority for radiation protection in Germany, stated in an interview in the *Berliner Morgenpost* that "Parents should take their children away from that technology [mobile phones]". Mr Koenig, also a member of Germany's Greens party, said that "Some people are very sensitive to radiation" and urged companies not to target children in their advertising campaigns.

4) In a statement delivered at an Australian Senate Inquiry meeting in 2001, CSIRO Telecommunications and Industrial Physics chief Gerry Haddad warned that the new telecommunications exposure standards do not require a high enough level of protection, particularly in relation to children. Mr Haddad advised: "Restrict use of mobile phones to children for essential purposes."

5) Olle Johansson, Associate Professor at the Experimental Dermatology Unit in the Department of Neuroscience at Karolinska Institute in Stockholm, Sweden, made this statement in an email to this

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author in September 2001:

"Already in 1996, I started to warn in public of the effects of microwave irradiation on children through their use of mobile telephones. The debate has also very much focussed on the responsibility regarding ads and products directly aimed for children, and here in Sweden great alarm has been raised around the propositions to develop and sell cellphones even for the ages up to five years."

6) Professor Sianette Kwee of the Department of Medical Biochemistry at the University of Aarhus, Denmark, emailed the following statement to the author in September 2001. Prof. Kwee is on the editorial board of *Bioelectrochemistry* and a Danish expert representative in the European Union's COST 281 project, "Potential Health Effects from Emerging Wireless Communication Systems", basic research group, whose fields of research are bioelectrochemistry (electroporation/electrochemistry of biological systems) and bioelectromagnetics (biological effects of environmental electromagnetic fields—extremely low frequency [ELF] and microwave [MW]—on cell growth in human amnion cells). She stated:

"Our studies showed that there was a significant change in cell growth in these cells after being exposed to EMF fields from both power lines (ELF) and from mobile phones (MW). These biological effects were greatest in young and vigorously growing cells, but much less in old cells.

These results tell us that, e.g., microwave fields from mobile phones can be expected to affect children to a much higher degree than adults."

7) This statement from Dr Gerard Hyland at the Department of Physics, University of Warwick, Coventry, England, is excerpted from his Report for the STOA Committee of the EU, specifically dealing with children and mobile phone use:

"The Increased Vulnerability of Pre-adolescent Children:

"Pre-adolescent children can be expected to be (potentially) more at risk than are adults—as recognised in the recently published Report of the UK Independent Expert Group on Mobile Phones—for the following reasons:

- Absorption of microwaves of the frequency used in mobile telephony is greatest in an object about the size of a child's head, the so-called head resonance, whilst, in consequence of the thinner skull of a child, the penetration of the radiation into the brain is greater than in an adult.

- The still-developing nervous system and associated brain-wave activity in a child (and particularly one that is epileptic) are more vulnerable to aggression by the pulses of microwaves used in GSM than is the case with a mature adult. This is because the multi-frame repetition frequency of 8.34 Hz and the 2 Hz pulsing that characterises the signal from a phone equipped with discontinuous transmission (DTX) lie in the range of the alpha and

delta brain-wave activities, respectively. The fact that these two particular electrical activities are constantly changing in a child until the age of about 12 years, when the delta waves disappear and the alpha rhythm is finally stabilised, means that they must both be anticipated to be particularly vulnerable to interference from the GSM pulsing.

- The increased mitotic activity in the cells of developing children makes them more susceptible to genetic damage.

- A child's immune system, whose efficiency is, in any case, degraded by radiation of the kind used in mobile telephony, is generally less robust than that of an adult, so that the child is less able to cope with any adverse health effect provoked by (chronic) exposure to such radiation."

8) An article in the UK *Sunday Mirror* of December 27, 2001, headed "The Child Scrambler: What a mobile can do to a youngster's brain in 2 mins", said:

"These are the first images that show the shocking effect that using a mobile phone has on a child's brain.

"Scientists have discovered that a call lasting just two minutes can alter the natural electrical activity of a child's brain for up to an hour afterwards. And they also found for the first time how radio waves from mobile phones penetrate deep into the brain and not just around the ear.

"The study by Spanish scientists has prompted leading medical experts to question whether it is safe for children to use mobile phones at all.

"Doctors fear that disturbed brain activity in children could lead to psychiatric and behavioural problems or impair learning ability.

"It was the first time that human guinea pigs were used to measure the effects of mobile phone radiation on children. The tests were carried out on an 11-year-old boy and a 13-year-old girl called Jennifer.

"Using a CATEEN scanner, linked to a machine measuring brain wave activity, researchers were able to create the images above.

"The yellow-coloured part of the scan on the right shows how radiation spreads through the centre of the brain and out to the ear on the other side of the skull. The scans found that disturbed brain-wave activity lasted for up to an hour after the phone call ended.

"Dr Gerald Hyland—a Government adviser on mobiles—says he finds the



results 'extremely disturbing'.

"It makes one wonder whether children, whose brains are still developing, should be using mobile phones,' he adds.

"The results show that children's brains are affected for long periods even after very short term use. Their brain wave patterns are abnormal and stay like that for a long period. This could affect their mood and ability to learn in the classroom if they have been using a phone during break time, for instance.

"We don't know all the answers yet, but the alteration in brain waves could lead to things like a lack of concentration, memory loss, inability to learn and aggressive behaviour.'

"Previously it had been thought that interference with brain waves and brain chemistry stopped when a call ended.

"The results of the study by the Spanish Neuro Diagnostic Research Institute in Marbella coincide with a new survey that shows 87 per cent of 11- to 16-year-olds own mobile phones and 40 per cent of them spend 15 minutes or more talking each day on them. And disturbingly, 70 per cent said they would not change the use of their phone even if advised to by the Government.

"Dr Hyland plans to publish the latest findings in medical journal *The Lancet* next year. He said: 'This information shows there really isn't a safe amount of mobile phone use. We don't know what lasting damage is being done by this exposure. If I were a parent, I would now be extremely wary about allowing my children to use a mobile even for a very short period. My advice would be to avoid mobiles.'

"Dr Michael Klieisen, who conducted the study, said: 'We were able to see in minute detail what was going on in the brain. We never expected to see this continuing activity in the brain. We are worried that delicate balances that exist—such as the immunity to infection and disease—could be altered by interference with chemical balances in the brain.'

"A Department of Health spokesman said: 'In children, mobile phone use should be restricted to very short periods of time.'"

9) Channel News Asia's Southeast Asia News ran this item, titled "Thai minister mulls cellphone ban for youngsters", on April 5, 2002 (see <http://www.channel-newsasia.com>):

"Thailand's interior minister is considering banning the use of cellphones by teenagers.

"Purachai Piemsomboon, whose campaign against vice has barred teenagers from pubs and night spots, cited a Japanese study which he said concluded that mobile phones emitted radiation harmful to brain cells and nerves, especially of young people. He said that if teenagers continued to ignore the warning, a law might become necessary to prevent them from using cellphones. He didn't elaborate."

10) This item, reporting the views of the WHO Director-General on children and mobile phone use, is sourced from

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*Microwave News* (vol. XXII, no. 2, March/April 2002, <http://www.microwave-news.com>):

"Dr Gro Harlem Brundtland, the Director-General of the World Health Organization (WHO), favours a precautionary approach to the use of mobile phones, according to press reports from Scandinavia.

"In an interview with *Dagbladet Norge* (March 9, 2002), a major Norwegian newspaper, Brundtland discouraged children from using mobile phones. A physician with a degree in public health, Brundtland is a former Prime Minister of Norway.

"Jon Liden, a communications advisor in Brundtland's office in Geneva, confirmed the accuracy of the Norwegian article to *Microwave News*.

"Brundtland's outlook appears to put her at odds with the WHO International EMF Project.

"Precautionary policies should not be applied to EMFs,' Dr Michael Repacholi, who oversees the project, stated recently (see *MN*, Sept/Oct 2001). He could not be reached for comment.

"Brundtland advises everyone to limit the amount of time on the phone, but she does not think there is enough scientific evidence to issue a formal warning.

"For herself, Brundtland says that she gets a headache whenever she uses a mobile phone.

"In the beginning I felt warmth around my ear. But the discomfort got worse and turned into a headache every time I used a mobile phone,' Brundtland said in the interview. 'Making shorter calls does not help,' she added."

"The interview was featured on the front page of *Dagbladet Norge* and was later picked up by the Swedish press."

11) The French Government, on March 1, 2002, reiterated an advisory to users of mobile phones, reminding them, on a precautionary basis, that: parents should tell their children to limit the use of wireless phones; that when using an earpiece, pregnant women should keep the phone away from their bellies; and that teenagers should keep their mobile phone away from their developing sex organs. (*Microwave News*, vol. XXII, no. 2, March/April 2002)

### The Australian authority's view

The Australian Communications Authority (ACA) has recently sent out to every school in the nation a pamphlet titled "Mobile phones: your health and regulation of radiofrequency electromagnetic radiation". In relation to possible health effects, the ACA pamphlet states only that "The weight of national and international scientific opinion is that there is no substantiated evidence that using a mobile phone causes harmful health effects".

This pamphlet was not written by scientists or medical experts but public relations (PR) professionals employed to promote the technology. They have identified children and young people as a major growth area for taking up mobile phone use and view evidence of health hazards as a risk to profits that needs to be "managed". They call it "environmental crisis management".

Unfortunately, the Australian Communications Authority, as a promoter of telecommunications technology, is closely allied with the mobile phone industry and, in fact, uses the same PR firms. Interestingly, most of the PR firms now working for telecommunications previously worked (or still do) for the tobacco industry

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and created what is now known as "tobacco science".

When the ACA pamphlet refers to "The weight of national and international scientific opinion", it is basically referring to the opinion of and radiofrequency exposure guidelines set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

What is not said, however, is that the ICNIRP guidelines are only based on high-level, short-term animal exposure studies, conducted to determine exposure limits set to avoid immediate hazards to health (such as heating of body tissue, called a "thermal effect") from high-level exposures.

Most importantly, ICNIRP does not examine the possibility of other non-thermal health effects arising from long-term, low-level radiofrequency/microwave exposure, such as from using a mobile phone for years.

As such, it is scientifically irrelevant to the issue. From a PR viewpoint, however, statements like "The weight of national and international scientific opinion" do sound impressive.

In 1995, Dr Ross Adey, one of the world's most respected and senior research scientists, in an email reply to this author commented on "The weight of national and international scientific opinion" by stating:

"The laboratory evidence for non-thermal effects of both ELF [power frequency] and RF/microwave fields now constitutes a major body of scientific literature in peer-reviewed journals. It is my personal view that to continue to ignore this work in the course of standard-setting is irresponsible to the point of being a public scandal." (D. Maisch, "Mobile Phones and their Transmitter Base Stations: the evidence for health hazards" [Senate submission], EMFacts Consultancy, April 1996, page 5)

## A precautionary approach

So what we have is an ideological battle between a few voices of reason calling for a precautionary approach to safeguard our children's health, based on sound science, versus the might of the mobile phone industry and their supporters, based on maximising corporate profits.

The outcome of this conflict may not be known for many years, until today's young mobile phone users are well into their adulthood. By then, if the warnings of health hazards prove to be true, irreversible damage to the health and wellbeing of many of these people will have been done.

For every parent who is tempted to allow unrestricted mobile phone use by their children, they need to ask themselves: is it worth the risk?

## About the Author:

Don Maisch is director of EMFacts Consultancy and has produced 24 publications and papers on a variety of health issues related to EM radiation exposure. See NEXUS 7/03 and 2/26 for his articles on RF/MW and EMR exposure standards.

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Richard Dawkins could just have easily been a cardinal in the pre-Enlightenment Church, and Milton a heretic. There is that lingering smell of dogma and belief in the air that permeates much of the cant of the 21st century scientific priesthood: the moves to censor "unacceptable" doctrines or teachings smack of traditional Church-style politics.

Unfortunately, the so-called watchdog, the mass media, is a lapdog in the case of science. Most reporters seem too overawed by the institution and its more famous players ever to ask any hard questions or conduct any serious investigative reporting.

No documentary exposing the weaknesses of the theory of evolution has ever been aired on British television. Doesn't that seem a bit odd?

For anyone truly serious about what is going on with science, Arp's essay is must-reading. His underlying contention is that science today is "impossibly authoritarian".

In an interview with Thomas Gold, published in the *Washington Post* in November 1999, the reporter noted:

*Eight years ago, when Gold was developing his theory, some geologists were so incensed that they petitioned to have the government remove all mention of it from the nation's libraries.*

And in our virginal naïvety, we thought scientists were against book-burning and were champions of free, independent thought and expression...

The article continued by pointing out that Gold took it in his stride:

*...the scientific world allegedly searching for truth is little more hospitable to it than when Galileo ran afoul of the Inquisition, he says.*

Gold was also critical of the peer review process that rose to ascendancy in the latter half of the 20th century.

Journalist Richard Milton, in his rebuttal letter to Auriol Stevens (the London *Times* Higher Education Supplement editor who had spiked his anti-Darwin article), wrote:

*I believe that the great strength of science and the scientific method is its openness to debate... Science does not need vigilante scientists to guard the gates against heretics... If this article were about any other subject—finance, politics, the economy—I know that it would be welcome as well-written and thought-provoking, even if its claims were controversial.*

But it was not about other subjects; it concerned the "sacred cow" of Darwinism. Milton may have been naïve at that point, but his "education" was just starting. There are many other "taboo" subjects that would not have been published.

The point of this series has not been to tar all scientists with the same brush. There are unquestionably many good, honest, hard-working scientists who are appalled by some of the unsavoury things going on in the name of science. But so many scientists seem to delight in attacking alternative science theory and its practitioners by branding the proceedings "pseudoscience", as if they were White Knights on a Divine Mission to preserve the integrity of science. What integrity? It is time they dropped all their debunking and cleaned up the institution before we get the scientific version of the Inquisition.

## About the Author:

Will Hart is a freelance journalist, book author, nature photographer and documentary filmmaker. He lives and does much of his research in the Lake Tahoe area in the USA, and writes a column titled "The Tahoe Naturalist" for a regional publication. He has produced and directed films about wolves and wild horses.